

CLAIMS:

1. A method for adaptively minimising the total power consumption of an apparatus comprising a subsystem comprising a mass storage device and a buffer memory, said method comprising the steps of
determining an optimum buffer size for which the power consumption of said
5 subsystem is a minimum for a given streaming bit-rate to/from said buffer memory, and
adjusting the buffer size of said buffer memory to said optimum buffer size,
such that the power consumption of said subsystem is minimal.
2. The method according to claim 1, wherein said step of adjusting the buffer
10 size comprises switching on memory banks and/or memory ICs of said buffer memory for
increasing the size of said buffer memory, and switching off memory banks and/or memory
ICs for decreasing said buffer memory.
3. The method according to claims 1 or 2, wherein the storage device is a
15 harddisk drive and the step of determining an optimum buffer size comprises
determining a harddisk drive data rate,
determining the stream bit-rate to/from the buffer memory, and
determining the optimum buffer size having the lowest power consumption at
the determined stream bit-rate.
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4. The method according to claim 3, wherein said optimum buffer size
determination step comprises calculating optimum buffer size from a formula, looking up
optimum buffer size in a look-up table, or measuring the minimum power consumption of the
subsystem in a feedback loop controlling buffer size.
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5. The method according to any of the preceding claims, wherein the optimum
buffer memory value is determined by the ratio of the stream bit rate and the disk bit rate
giving the duty cycle of the harddisk drive for calculating/estimating the harddisk drive
power consumption, which subsequently is used to determine the optimal buffer size.

6. The method according to any of the preceding claims comprising powering up extra memory banks and/or memory ICs when a new stream is admitted.
- 5 7. The method according to any of claims 1 to 5, wherein a powering down of a memory bank or IC is either delayed or the buffered data of that memory bank or IC is moved to another memory bank that will remain powered on after which the first bank is shut down immediately, when a stream is stopped and removed.
- 10 8. The method according to any of the preceding claims, wherein in case of multiple simultaneous streams, the sum of the bit-rates of all streams is determined.
9. A circuit for retrieving data from a mass storage device via a memory buffer comprising a processing unit conceived to:
- 15 - adaptively activate or deactivate areas of said buffer memory in such a manner that total power consumption of a subsystem comprising said storage device and said buffer memory is minimised for a given streaming rate to/from said buffer memory; and
- retrieve the data from the mass storage device.
- 20 10. An apparatus comprising a subsystem comprising mass storage device, a buffer memory and the circuit according to claim 9.
11. The apparatus according to claim 10, wherein said buffer memory comprises SDRAM circuits having banks of memory adapted to be independently switched on/off.
- 25 12. The apparatus according to claims 10 or 11, wherein a scheduler function executable by the processing unit controls accessing the storage device and the buffer memory.
- 30 13. A computer-readable medium having embodied thereon a computer program for processing by a computer, the computer program comprising code segments for adaptively minimising the total power consumption of a subsystem comprising a mass storage device and a buffer memory, wherein

a first code segment determines an optimum buffer size for which the power consumption of said subsystem is a minimum for a given streaming bit-rate from said buffer memory, and

- 5 a second code segment adjusts the buffer size of said buffer memory to said optimum buffer size, such that the power consumption of said subsystem is minimal.